

What is claimed is:

1. A method for risk stratification of potential chronic pain patients in a population, comprising:

selecting direct medical indicia associated with chronic pain that serve as independent variables;

selecting indirect medical indicia associated with chronic pain that serve as independent variables;

selecting non-medical indicia associated with chronic pain that serve as independent variables;

selecting a chronic pain indication that serves as a dependent variable;

creating a chronic pain risk model using direct medical indicia, indirect medical indicia, non-medical indicia, and chronic pain indication;

applying the chronic pain risk model to potential chronic pain patients to create a patient mathematical expression for each potential chronic pain patient; and,

stratifying potential chronic pain patients by comparing each patient mathematical expression to selection objectives.
2. The method as in claim 1 wherein the chronic pain risk model comprises

a logic structure to define a logical decision process to operate on the independent variables and to progressively reach greater certainty about potential chronic pain patient risk;

weighted variables to reflect greater relevance of certain direct medical indicia, indirect medical indicia, and non-medical indicia to the chronic pain indication; and,

equations that represent relationships between or among weighted variables to form a chronic pain risk inference engine.

3. The method as in claim 2 wherein the chronic pain risk model comprises,
at least fifty dependent variables;
at least thirty independent variables; and,
at least fifty equations.
4. The method as in claim 2 wherein the logic structure is developed using Chi-Square Automatic Interaction Detection (CHAID) analysis to establish relationships between a dependent variable and independent variables.
5. The method as in claim 2 wherein the logic structure is developed using Classification Adjusted Regression Tree (CART) analysis to establish relationships between the dependent variable and the independent variables.
6. The method as in claim 2 wherein the weighted variables are developed using logistical regression to establish relationships between the dependent variable and independent variables.
7. The method as in claim 2 wherein the weighted variables are developed using discriminate analysis to establish relationships between the dependent variable and independent variables.
8. The method as in claim 2 wherein appropriateness of patient indicia is evaluated using the Hosmer-Lemeshow Goodness of Fit Analysis.
9. The method as in claim 1 wherein potential chronic pain patient risk is identified with a patient mathematical expression generated by the chronic pain risk inference engine operating on the patient indicia and the chronic pain indication.

10. The method as in claim 9 wherein the patient indicia are monitored and for changes and the patient mathematical expression is updated when patient indicia change.
11. The method as in claim 1 further comprising,
establishing categorization preferences that specify patient risk characteristics that are
desired to be selected;
calculating the categorization preferences with each potential chronic pain patient's
mathematical expression to identify relationships between the categorization
preferences and each potential chronic pain patient's mathematical expression;
and,
categorizing each potential chronic pain patient based upon the relationships between the
categorization preferences and each potential chronic pain patient's mathematical
expression.
12. The method as in claim 1 wherein the selection objectives are selected from the group
consisting of high probability of pain episode, low probability of pain episode, acute pain,
chronic pain, low treatment immediacy, medium treatment immediacy, high treatment
immediacy, high cost, and low cost.
13. The method as in claim 1 wherein the direct medical indicia are related to chronic pain
risk in a known medical manner and recorded by a clinician.
14. The method as in claim 13 wherein the direct medical indicia are independent variables
selected from the group consisting of primary diagnosis, associated secondary diagnosis,
co-morbidities, drug treatment regimen, telephone consultations with a clinician, trauma
episodes, palliative care, rehabilitative care, clinician office visits, emergency room visits,
and hospitalizations.

15. The method as in claim 13 wherein the sources for direct medical indicia are selected from the group consisting of claims records, medical records, workers' compensation records, and employer records.
16. The method as in claim 1 wherein indirect medical indicia are a chronic pain co-morbidity that is recorded by a clinician.
17. The method as in claim 16 wherein the indirect medical indicia are independent variables selected from the group consisting of mental health condition, acute respiratory episodes, diabetes, and heart failure.
18. The method as in claim 16 wherein the sources for indirect medical indicia are selected from the group consisting of claims records, medical records, workers' compensation records, employer records, and patient surveys.
19. The method as in claim 1 wherein the non-medical indicia are independent variables selected from the group consisting of alcohol consumption, smoking status, weight gain, pain perception factors, life satisfaction measures, patient support structure, day-time distractions, marital relationship quality, personality profile, psychological profile, courtroom demeanor, reputation for truth and veracity, demeanor of associates, reputation of counsel, familial persuasion, financial needs, financial expectations, legal experience, personal injury history, family and friends injury history, cognitive ability, emotional maturity, and media reporting related to the indication.
20. The method as in claim 19 wherein the sources for non-medical indicia are selected from the group consisting of medical records, patient surveys, patient self-reports, employer databases, workers' compensation records, medical chart reviews, patient interviews, treating clinician interviews, and family member interviews.

21. The method as in claim 1 wherein the chronic pain indication is selected from the group consisting of Peripheral Neuropathy; Stump Pain; Phantom Pain; Complex Regional Pain Syndrome Type I (Reflex Sympathetic Dystrophy); Complex Regional Pain Syndrome Type II (Causalgia); Central Pain; Rheumatoid Arthritis; Osteoarthritis; Sickle Cell Arthropathy; Stiff Man Syndrome; Osteoporosis; Guillain-Barre Syndrome; Superior Pulmonary Sulcus Syndrome (Pancoast Tumor); Pain of Skeletal Metastatic Disease of the Neck, Arm, or Shoulder Girdle; Carcinoma of Thyroid; Post Herpetic Neuralgia; Syphilis (Tabes Dorsalis and Hypertrophic Pachymeningitis); Primary Tumor of a Vertebral Body; Radicular Pain Attributable to a Prolapsed Cervical Disk; Traumatic Avulsion of Nerve Roots; Primary Tumor of a Vertegral Body; Radicular Pain Attributable to a Thoracic Disk; Chemical Irritation of the Brachial Plexus; Traumatic Avulsion of the Brachial Plexus; Postradiation Pain of the Brachial Plexus; Painful Arms and Moving Fingers; Brachial Neuritis (Brachial Neuropathy, Neuralgic Amyotrophy, Parsonage-Turner Syndrome); Raynaud's Disease; Raynaud's Phenomenon; Frostbite and Cold Injury; Brythema Pernio (Chilblains); Acrocyanosis; Livedo Reticularis; Volkmann's Ischemic Contracture; Thromboangiitis; Intermittent Claudication; Rest Pain; Gangrene Due to Arterial Insufficiency; Other Postinfectious and Segmental Peripheral Neuralgia; Angina Pectoris; Postmastectomy Pain Syndrome (Chronic Nonmalignant); Late Postmastectomy Pain or Regional Carcinoma; Segmental or Intercostal Neuralgia; Chronic Pelvic Pain Without Obvious Pathology; Pain from Urinary Tract; Carcinoma of the Bladder; Lumbar Spinal or Radicular Pain after Failed Spinal Surgery; Spinal Stenosis (Cauda Equina Lesion); Pain referred from Abdominal or

Pelvic Viscera or Vessels Perceived as Sacral Spinal Pain; Femoral Neuralgia; and, Sciatica Neuralgia.

22. The method as in claim 21 wherein the source for chronic pain indications is the International Association for the Study of Pain (IASP) chronic pain guidelines.
23. The method as in claim 1 wherein the patient population is selected from the group consisting of payer database, employer database, clinician database, and workers' compensation database.
24. A method for risk stratification of potential chronic pain patients, comprising:
 - accessing a chronic pain risk model having direct medical indicia, indirect medical indicia, non-medical indicia, and a chronic pain indication that are arranged in a logic structure, with weighted variables, and equations representing relationship between or among the variables;
 - applying the chronic pain risk model to potential chronic pain patients to create a patient mathematical expression for each potential chronic pain patient;
 - identifying potential chronic pain patients risk by comparing each patient mathematical expression to selection objectives;
 - establishing categorization preferences that specify characteristics of patents that are desired to be categorized;
 - calculating the categorization preferences with each potential chronic pain patient's mathematical expression to identify relationships between the categorization preferences and each potential chronic pain patient's mathematical expression;

categorizing each potential chronic pain patient based upon the relationships between the categorization preferences and each potential chronic pain patient's mathematical expression; and,
monitoring the potential chronic pain patient's direct medical indicia, indirect medical indicia, and non-medical indicia for changes and updating the patient's mathematical expression based upon changes to the potential chronic pain patient's direct medical indicia, indirect medical indicia, and non-medical indicia.

25. A computer software product that includes a medium readable by a computer, the medium having stored thereon instructions for stratifying potential chronic pain patients, comprising:

a first set of instructions when executed by the computer, causes the computer access a chronic pain risk model having direct medical indicia, indirect medical indicia, non-medical indicia, and a chronic pain indication that are arranged logic structure, with weighted variables, and equations representing relationship between or among the variables;

a second set of instructions when executed by the computer, causes the computer to applying the chronic pain risk model to potential chronic pain patients to create a patient mathematical expression for each potential chronic pain patient population; and,

a third set of instructions when executed by the computer, cause the computer to stratify potential chronic pain patients according to risk by comparing each patient mathematical expression to selection objectives.

26. The computer software product as in claim 25, further comprising,
- a fourth set of instruction when executed by the computer, cause the computer to
- establish categorization preferences that specify characteristics of patents that are
- desired to be categorized;
- a fifth set of instruction when executed by the computer, cause the computer to calculate
- the categorization preferences with each potential chronic pain patient's
- mathematical expression to identify relationships between the categorization
- preferences and each potential chronic pain patient's mathematical expression;
- and,
- a sixth set of instruction when executed by the computer, cause the computer to
- categorize each potential chronic pain patient based upon the relationships
- between the categorization preferences and each potential chronic pain patient's
- mathematical expression.
27. A method for sensitivity analysis of a chronic pain patient model, comprising:
- comparing the stratified chronic pain patients with outside diagnosed chronic pain patient
- data to create a patient error list;
- applying an error assessment model to the patient error list to identify the non-
- corresponding patient indicia that contributed to the errors;
- applying a sensitivity analysis model to the non-corresponding patient indicia to identify
- potential patient indicia changes to reduce errors in identifying chronic pain
- patients;

selecting at least one patient indicia change from the potential patient indicia changes to
apply to the patient indicia; and,
modifying the patient indicia with the at least one selected patient indicia change.

28. The method as in claim 27, further comprising

applying a sensitivity analysis model to the weighted variables to identify potential
weighted variable changes to reduce errors in stratifying potential chronic pain
patients;

selecting at least weighted variable change from the potential weighted variable changes
to apply to the weighted variables; and,
modifying weighed variables to reflect greater or lesser relevance of patient indicia to
reduce errors in stratifying chronic pain patients.